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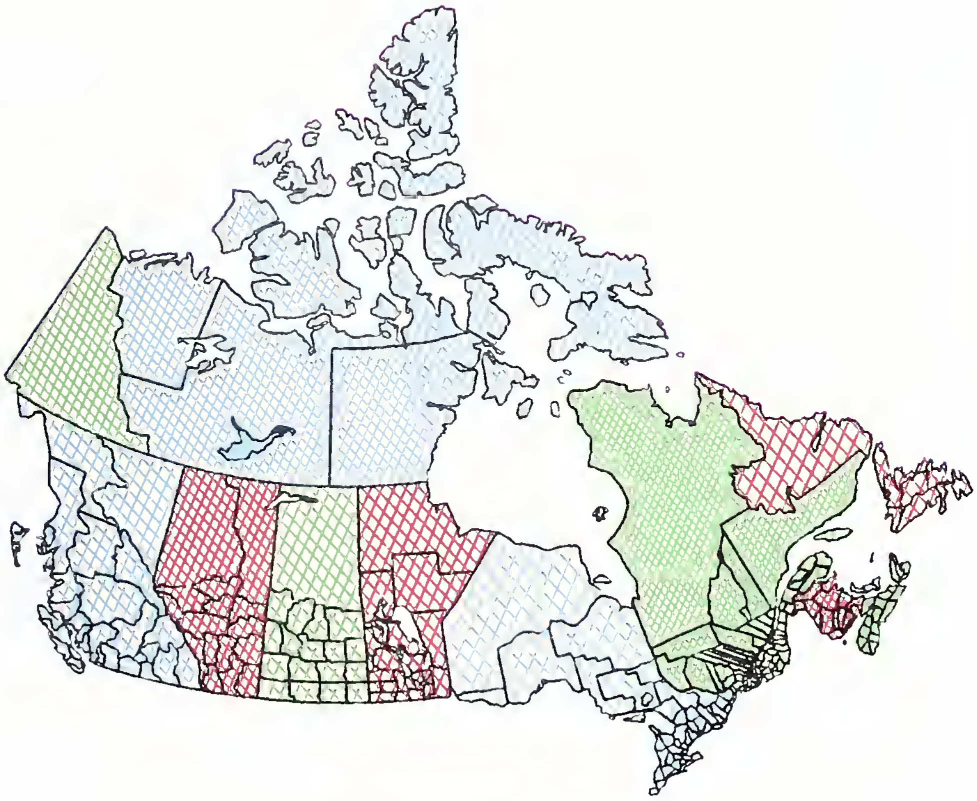
U T C S



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CALCOMP 1051 / SAS GRAPH / KIG

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COMPUTERNEWS

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Cover

What's being plotted at UTCS? Turn to page 3.

(Thanks to Kin Fong, Paul Scarborough and Bruce Wildfong for their assistance with this month's cover production.)

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CALCOMP 1051 COLOUR PLOTTER

Colour graphs and plots are now rolling out of the Calcomp 1051 plotter. More specifically, high quality line graphs, charts, floor plans, architectural drawings, contours and three dimensional perspective plots are being produced by the Calcomp 1051.

A free User Test of the new plotter ran from November 2nd to the 6th. The test went very well and a full report of the results will appear in the next issue of *COMPUTERNEWS.*

SAS/GRAPH, a high level graphics package, is supported for Calcomp 1051 via KIG's basic subroutines. An example of the kind of colour plot which can be produced is featured on the front cover of this issue. Using the map data provided by SAS, we produced a map of Canada by provinces and census districts.

The transition to the new plotter should be fairly transparent to users except, of course, for the improvement in quality, the availability of colour and the transferability of software and graphics output among different graphics devices. While new documentation is being prepared for the Calcomp 1051, the basic changes and additions are outlined in the following paragraphs.

Calcomp Changes

The Calcomp 1051 is supported through the machine independent graphics software package, KIG. This means that:

1. All existing Calcomp source programs for the old Calcomp 760s will continue to work, and
2. source programs for the GOULD will work for the Calcomp 1051 as well.

In fact, user graphics programs will now be able to use the Calcomp 1051, Gould 5200 and UTCS-supported graphics terminals. The only change that users may have to make to their programs is to delete the third and fourth arguments in their Calcomp subroutine calls to PLOTST. (See USERBOOK Section 3.8PLOTBASIC for more information.)

The old offline Calcomp 760s required a SETUP card for the tape mount. The new Calcomp 1051, however, is operated online. This means that users can now run their Calcomp jobs in Class A *without* any SETUP card.

The procedures FORTPLOT and PLOT will be changed for Calcomp jobs when the Calcomp 1051 is put into production status. These procedures will remain basically the same, but for the name of the Calcomp library and the fact that the graphic vectors will be sent to the Sysout Spool rather than a file on tape.

A typical Calcomp run can be invoked as follows:

```
job cards
//to EXEC FORTPLOT[,IX=...,LIBRARY=...]
//FORT.SYSIN DD *
  user calcomp fortran program
//GO.SYSIN   DD *
  user input data if any
/*
```

The Calcomp plots produced will be filed by the graph-id-name at the beginning of the plot. The graph-id-name is the first argument to PLOTST or the programmer name in the Job Card if PLOTST is not used. Since the Calcomp 1051 is located at McLennan Labs, the rule for filing by the graph-id-name is the same as that for any other output produced at McLennan Labs. (See the table at the end of this article for filing rules.) convenience.

The documentation of available subroutines in USERBOOK 3.8PLOTBASIC and 3.8PLOTBASIC.SUBEXT will remain valid with the following additions and exceptions:

continued...

CALCOMP 1051 COLOUR PLOTTER continued

1. To make use of the four pens for colour plots, a new subroutine NEWPEN is available. The Fortran statement

   ```
   CALL NEWPEN( i )
   ```

   where i is 1, 2, 3 or 4 will result in the selection of pen i. The chosen pen number will remain unchanged until the next call to NEWPEN. After a call to PLOTST or PLOTS, pen 1 is chosen by default.
2. Multiple plots are now permitted in one job (as with Gould).
3. Better control of plot size will result by making PLOTS available for Calcomp as well. Subplots are limited to 163 inches in length (as with Gould).
4. Compulsory boundary checks will be imposed. Lines that would be drawn outside the graphics space boundary will be clipped. Warning messages will be issued and execution will continue.
5. Optional subroutines for tracing and limiting plot movement, such as LISTON, LISTOFF, PLTXMX, PLTCHK, PLTCKX, PLTCKY, PLTPAG and PLTSET, will be accepted but ignored (see item (4) above).
6. The interpretation of LINEWT may be different for Calcomp, Gould and Graphics terminals. Users should avoid using LINEWT for Calcomp jobs until the facility has been fully developed by UTCS.

Filing by graph-id-name

GRAPH-ID-NAME	DESTINATION
//EAT//ARSCT.name	Arts and Science Graduate Terminal
//EAT//ERINT.name	Erindale Terminal
//EAT//PAT.name	Policy Analysis Terminal
//EAT//PHYST.name	New Physics Terminal
//EAT//SCART.name	Scarborough Terminal
//EAT.name	Engineering Annex Terminal
//name	McLennan Labs 3rd Floor (behind service counter)
name	McLennan Labs 3rd Floor (behind service counter)

Kin Fong

DEMYSTIFYING DATA:

STRAIGHT TALK FROM A STATISTICIAN

Computers have enabled us to store and organize great quantities of data. Frequently, understanding this data necessitates going beyond merely looking at the numbers to employing more advanced methods of analysis. With the increasing availability of large statistical packages, the user now has at his disposal powerful tools to aid him in this task.

Professor David Andrews of U. of T.'s Department of Statistics is one of Canada's leaders in the field of statistical computation. He spoke with me at length on a variety of subjects relating to statistical computation, ranging from his own research in dynamic computer graphics to general counsel on the use of statistical software packages.

As Director of U. of T.'s Statistical Consulting Service, Prof. Andrews is in an excellent position to comment on the benefits and potential pitfalls that attend the use of statistical programs. The Statistical Consulting Service was established in 1978 to serve

continued...

DEMYSTIFYING DATA continued

the needs of the university research community, including teaching hospitals. Although its primary function is to serve as a training ground for graduate students, both faculty members and students provide expert statistical consultation. Most of the large, ongoing consulting projects stem from medical research, but researchers from a surprisingly wide variety of disciplines - including history, French, library science and foresty - also make use of the service.

Highlights from our conversation are printed below. His insights will be of interest to anyone who has ever used, or contemplates using, statistical programs.

* * * * * * *

- I asked his opinion of the statistical packages currently available through UTCS. His response was characteristically positive:

"First, let me say that a surprisingly large fraction of the 3033 is devoted to statistical computing of one sort or another, and the easy availability of the common statistical packages has facilitated this use. We have an excellent collection of statistical packages on this campus, including the major four - GENSTAT, SAS, BMDP, AND SPSS - which are preferred in the statistical literature (in that order) for quality of calculations and flexibility of use. The general feeling in statistical circles is that while GENSTAT is the superior system, it requires a high degree of statistical sophistication in the user. In fact, unless compelling reasons demand you do otherwise, we would recommend the use of SAS, which is sufficient for almost all purposes."

- While statisticians encourage their use as convenient computing tools for persons without statistical experience, problems may ensue in practise. I asked what general advice he might have for researchers contemplating using statistical packages as an instrument of data analysis.

"From our experience at the consulting service, misapplication of the packages is not a real problem. Most of the major problems we've seen stem from a more basic issue, and that is whether or not an appropriate model for the data has been considered. The role of the statistician in research projects is more in focussing on the right sorts of questions: determining precisely what can be investigated. We've had an unfortunate number of cases at the consulting service where a modest amount of planning would have yielded much more information out of an experiment.

"With regard to the packages themselves, there is a need for a certain amount of caution in their use. Problems may arise, for example, when researchers put too much faith in the statistical methods themselves. I find that the farther people are from statistics, the greater their faith in complex procedures like factor analysis and principle components. These procedures perform a fair amount of calculation, and so alter data considerably, often in ways that are difficult even for statisticians to fully comprehend. In such a situation, if I have little understanding, I have little faith in the validity of the enterprise. Therefore, because the operation of sophisticated statistical procedures often requires advanced expertise to understand, they should be used judiciously.

"In most research applications, very simple summaries, in terms of averages and medians, will be more than adequate. The advantage is obvious: the simpler the procedure used, the more immediately and clearly understood the implications of the calculations will be to both user and reader.

"In many fields now, especially medicine, anecdotal experiences aren't sufficient; well-designed experiments with carefully analyzed results have become not only desirable but necessary. We would encourage people who have problems where they believe that a well-designed, carefully thought out experiment should establish a particular fact, to use statistical programs.

continued...

DEMYSTIFYING DATA continued

The 'big four' statistical packages are superb tools for data management and data summaries - as long as the summaries are of a simple nature, like cross-tabulation."

Graphic Displays: One Picture is Worth a Thousand Numbers

A tiny room on the fifth floor of Sidney Smith, crammed with a variety of graphical display devices, has witnessed some remarkable developments in the statistical applications of computer graphics. Here, Prof. Andrews was happy to produce for the interviewer a minor spectacle on the oversized screen of a GT41 terminal. At first glance, a whirling, pirouetting random arrangement of symbols appeared to fill the centre of the screen. Closer inspection, however, revealed a seemingly three dimensional cluster revolving about an invisible axis.

Prof. Andrews was eager to discuss the deeper research implications of such 'real time dynamic displays'. But first, I asked him about the value of graphs as instruments of data analysis in general.

"The main function of statistics is to uncover the pattern and structure in a collection of observations, and occasionally to pronounce on the significance of some aspect of that pattern. One of the best ways to summarize and present that information is through graphical methods. Early statistical packages failed to realize or exploit this, but machines can produce graphs very readily and inexpensively, *and* they can convey much more information to the observor - in a genuinely stimulating way - than a numerical summary, which can be misleading in ways that are hard to understand."

- The graphs you have worked to develop represent a fairly radical departure from conventional statistical graphics. Could you explain how these apparently three-dimensional graphs work, and how they differ from standard computer graphs?

"A conventional graph is two dimensional, showing the relationship between things two at a time. We can now understand the relationship between variables or components not two at a time, but three at a time. Dynamic graphs work on the same principle as animation: a series of two-dimensional graphs following each other in sequence simulate movement - in this case, rotation. An ordinary terminal is used to display the data, and the rotation simulates the three dimensional characteristics of the data. Through careful observation of these graphs we can understand relations that are obscured in a two-dimensional graph."

- Could you give an example of how dynamic graphs have been used in research?

"An application arose in a recent study where we were looking at the detection of muscular dystrophy, and, in particular, the screening of potential carriers of the disease. One enzyme found in the blood was commonly thought to be good for screening purposes. A second, similar enzyme was thought to be useless, although the basic biochemistry suggested they should both be valuable. Effectively, the researchers were working with three quantities - a good enzyme, a questionable enzyme, and a variable describing whether people are carriers or not.

"In order to understand the relationship between these three variables, one had to display a three dimensional configuration. Seeing them two at a time wasn't enough; in fact, this had led researchers to the erroneous conclusion that the second enzyme had little effect. Displaying things three at a time clearly showed the significance of the questionable enzyme as a screening agent."

- Is this facility likely to become widely available in the near future?

"Currently, dynamic graphs are being used by only a few groups. At Harvard, related techniques are being used for the understanding of complex statistical problems, and researchers at the Stanford Linear Accelerator have been using them for the

continued...

DEMYSTIFYING DATA continued

study of high energy physics. As yet, it's a case where the development of tools is still in its infancy, and more time is being spent on development than on applications.

"The purpose of development, however, is to create tools that can be widely distributed. The basic development of these graphs ran off relatively expensive hardware - a PDP 11/70 and a device called a GT41 - though we learned, surprisingly, that the displays could be produced on inexpensive micro-computers. I look forward with confidence to the time when a great percentage of people on campus will have access to local and central processing for this tool."

- Speaking of micro-computers, it would appear that the proliferation of inexpensive hardware in the computer world is accelerating. Looking into the future, what impact do you see this as having on the field of statistical computation?

"It seems certain that people will attempt to use micro-computers as widely as possible, for a variety of reasons. They tend to be friendly machines, available whenever you want them, and there's the idea, perhaps fallacious, that cost is negligible. However, I view the the use of these machines for large data analysis problems as unwise in the extreme. The advantages of a large central machine are allied with its ability to store and share both data and software. The dangers of small, cheap micros are simply the hazards of human time wastage, the inefficient use of a valuable resource. In other words, to attempt a big job on a small machine, you must invest an inordinately large amount of time, trouble, and involvement."

This concluded our brief interview. However, the conviction clearly reflected in Prof. Andrew's words is worth articulating - that is, his faith that the computer can be used to produce not just numbers but understanding.

Kathy Dunlop

SAS GRAPH/KIG UPGRADE

An upgraded SAS to KIG interface was installed on October 26, 1981. It now supports a number of new terminal types and options. The upgrade is upwardly compatible and the enhancements are mostly in response to user requests.

FIX:

- The **CHARACTER option** in the GOPTIONS statement now works and will be the recommended option. It will use KIG's instead of SAS's character routines, and will produce uniform results across different devices.

ENHANCEMENTS:

- **Seven more terminal types** will be supported. They are: TEK4015, DEC VT52, VC303A, DMC1100, DMX1100A, MULT13 and Cybernex.
- **Hardware Characters** will be supported for most terminals. For example, to select the hardware characters of the Xerox Diablo terminal, users will specify DEVICE=XRX1620H. This facility will reduce the plotting time significantly at 300 baud.
- The **UNIT option** is now used to indicate a rotation of 180 degrees if a negative value is specified for it.

  For example: GOPTIONS UNIT=-180

  This option in combination with ROTATE and DEVICE=XRX1620H will produce graphs with the "right side up" on the Xerox terminals.

continued...

SAS GRAPH/KIG UPGRADE continued

- Each **PROC statement** will produce one header (the "box" with the programmer's name) in GOULD.

- Each graph produced by SAS will be a subplot in GOULD. This one-to-one correspondence will allow users more flexibility in previewing, editing, transforming and overlapping the SAS graphs (subplots) using KIG.

- After a SAS graph (subplot) is produced in TSO, a bell will ring requesting a reply (carriage return) from the user before SAS will continue. This will make our devices conform with the default action of SAS.

- Section GOPTION below contains a list of supported devices and their recommended options. The convention for the device name nnnnx under KIG is such that:

nnnn = device name and/or model number
and
x = blank if nnnn is not originally supported by SAS
= K if nnnn is originally supported by SAS
= H if hardware characters of device nnnn is required.

GOPTION:

Recommended options and suggested initial trial values for HSIZE, VSIZE, HPOS and VPOS are as follows:

GOULD

GOPTIONS

```
DEVICE=GOULD
CHARACTERS
HSIZE = 10.5
VSIZE = 10.5
HPOS = 108
VPOS = 72
COLORS = (NORMAL TRIPLE DOUBLE SINGLE
         DOTTED1 DOTTED2 DOTTED3 DOTTED4);
```

Hewlett-Packard

GOPTIONS

```
DEVICE=HP2648K
CHARACTERS
HSIZE = 10.5
VSIZE = 10.5
HPOS = 36
VPOS = 24
COLOURS = (NORMAL TRIPLE DOUBLE SINGLE
      DOTTED1 DOTTED2 DOTTED3 DOTTED4);
```

TEKTRONIX

GOPTIONS

```
DEVICE=TEK4015K
CHARACTERS
HSIZE = 10.5
VSIZE = 10.5
HPOS = 51
VPOS = 34
COLOURS = (NORMAL TRIPLE DOUBLE SINGLE
         DOTTED1 DOTTED2 DOTTED3 DOTTED4);
```

XEROX Diablo

a) 1st choice
GOPTIONS

```
DEVICE=XRX1620H /* for hardware characters*/
CHARACTERS  UNIT=-180 ROTATE
HSIZE = 5.0   /* or 10.0 larger
VSIZE = 5.0         10.0 but
HPOS = 45           90  takes
VPOS = 30           60  longer */
COLOURS = (NORMAL TRIPLE DOUBLE SINGLE
          DOTTED1 DOTTED2 DOTTED3 DOTTED4);
```

b) 2nd choice
GOPTIONS

```
DEVICE=XRX1620K /*for software characters*/
CHARACTERS  UNIT=0  NOROTATE
HSIZE = 5.0
VSIZE = 5.0
HPOS = 45
VPOS = 30
COLORS = (NORMAL TRIPLE DOUBLE SINGLE
         DOTTED1 DOTTED2 DOTTED 3 DOTTED4);
```

DECVT52

GOPTIONS

```
DEVICE=DECVT52H /* for hardware characters*/
CHARACTERS  UNIT=-180 ROTATE
HSIZE=6
VSIZE=6
HPOS=45
VPOS=30
COLORS = (NORMAL);
```

continued...

SAS GRAPH/KIG UPGRADE continued

VC303A and Cybernex

```
GOPTIONS

DEVICE=VC303AH /*for VC303A with hardware
                 characters*/
/* or
DEVICE=CYBERH /*for Cybernex with hardware
                 characters*/
CHARACTERS  UNIT=-180 ROTATE
HSIZE = 8
VSIZE = 6
HPOS = 60
VPOS = 30
COLORS = (NORMAL);
```

DMC1100, DMX1100A AND MULTI3

The same options and values as that for the Xerox Diablo may be used except that the device name XRX1620H is to be replaced by

DMC1100H,
DMX1100H,
or
MULTI3H

and XRX1620K is to be replaced by

DMC1100K,
DMX1100K,
or
MULTI3K

for the respective terminal types.

Kin Fong

UNIVERSITY OF TORONTO COMPUTING SERVICES CHRISTMAS & NEW YEAR HOLIDAY SCHEDULE													
	23	24	25	26	27	28	29	30	31	1	2	3	4
	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
*APL/ATMS Services	N	UO	UO	UO	SS*	SS*	SS*	SS*	SS*	UO	SS*	SS*	N
Academic 3033 Facilities	N	X	X	X	SS	SS	SS	SS	SS	X	SS	SS	N
DEC-10 Facilities	N	UO	UO	UO	SS*	SS*	SS*	SS*	SS*	UO	SS*	SS*	N
CSS Facilities	N	K	K	K	K	K	K	K	K	K	K	K	N

Access to EUT, EAT, UNIX VAX 750, Keypunch and terminal facilities in the Engineering Annex will be available at hours when the 3033 is scheduled for operation. Users of other terminal sites should watch for signs or check with their CSR.

On Wednesday, December 23, all services/facilities will be available to 24:00.

The UTCS *offices* will be closed from 5 PM Wednesday, December 23 to 9 AM Monday, January 4, 1982.

KEY

Academic 3033 - GPJS, HSJS, TSO, WYLBUR
CSS - Communication & Small Systems
DEC-10 - Time-sharing, 11/70

X Closed

UO Unattended Operation

SS Single Shift
9am - 5pm

N Normal Hours of Service

K Communication & Small Systems facilities will be open to Keyholders as usual.

* DEC-10, 11/70, APL and ATMS will be running unattended after 5pm. Service may be interrupted for brief periods to perform system backups, etc.

Users should note that this is a tentative schedule and may be altered via HOTNEWS and alert notices closer to the Christmas period.

UNIX

UNIX is a multi-user, multi-task operating system with a powerful user interface. It incorporates many advanced features including:

- a tree structured filing system
- compatible file device and interprocess input/output
- the ability to initiate asynchronous processes
- a sophisticated, flexible command language which permits the construction of powerful applications written in the command language itself.

The standard system contains over 100 utilities, including compilers, editors, text and information processing programs, graphics software, electronic mail and computer aided instruction.

UNIX offers online help for beginning students in the form of a manual called ‘man’ which covers a variety of topics. To obtain information on how to send mail to a fellow student, for example, enter the command **man mail.**

Several teaching files called ‘learn’ are also available, which provide specific information on the following topics:

- editor
- eqn
- files
- macros
- morefiles
- C

As well as these online teaching aids, UTCS will be offering a short course on UNIX. For more information see the following article.

UTCS, in co-operation with a steering committee appointed by the Vice President (Research and Planning) has established a new UNIX Service for the advanced instructional needs of the Department of Computer Science and the Electrical Engineering Department. This service, which operates on a VAX 11/70, is currently available at the Engineering Annex, Scarborough and Erindale College.

At the Engineering Annex, the facilities include 14 Lanpar XT-100 terminals, 8 Soroc terminals and 2 Lear-Siegler terminals. The Lear-Sieglers are graphics terminals for the use of students in graphic courses. Two Soroc terminals will be exchanged for two more Sieglers in the near future. Three Teletype line printers are also available. The Facilities Co-ordinator at the Annex site (room 201) is no other than myself - Andrew Mountain. I can be reached during normal working hours at 978-4310. The facilities are available 24 hours a day, 7 days a week.

The Scarborough facilities, located in Room S636, include 4 Lanpar XT-100 terminals and 1 Lanpar Decwriter III line printer. The co-ordinator, Shirly Manimalethu, can be reached at 284-3122 or in Room S624. Scarborough’s hours of service are 09:00-24:00 Monday to Friday and 10:00-17:00 Saturday. The facilities are closed on Sundays.

Erindale has 4 Lanpar XT-100 terminals and a Lanpar Decwriter III line printer located in Room 2005. If terminal problems develop, contact Howard Lem in Room 2135 or call 828-5339. Hours of service at Erindale are 09:00-22:00 Monday to Thursday, 09:00-17:00 Friday and 12:00-18:00 Saturday and Sunday.

Andrew Mountain

UNIX TEXT PROCESSING SHORT COURSE

In addition to the courses listed in the article "Fall Short Courses" *(COMPUTER-NEWS* 193), UTCS will be offering the following text processing course in 1981-82. The course takes 5 half-days and involves a registration fee of $10, payable in cash or non-computing appropriation at least 3 days before the first meeting. Registrants are required to hold a valid UTCS account for use during the course. Registration and fees are handled by:

Information Services
Room 206, Engineering Annex Bldg.
978-4990

TXT103 -- UNIX Text Processing for Beginners

UNIX is a sophisticated operating system which runs on many Digital Equipment Corporation computers. It provides a text/word processing system conceptually similar to SOS/RUNOFF on the DECsystem-10. However, UNIX also has many powerful text-oriented utility programs and special tools to assist in the preparation of simple or complex tables and mathematical formulae. In addition, UTCSs UNIX text processing service is able to produce output of a quality higher than that available with conventional terminals or a line-printer using the CAT typesetter.

TXT103 is an introduction to the Text/Word Processing facilitites provided by UTCS's UNIX system. While this course is intended for users with no experience in word processing, it is particularly recommended for those who are already comfortable in a UNIX environment. It is a "hands-on" course, and users are advised that a UTCS UNIX account will be required.

Major topics of discussion will be word processing concepts, line-oriented editing of text (using "ed"), and basic text formatting concepts (using "nroff/troff").

John Bradley

SAS 79.5 INFORMATION

Several online sources of information are available that might be useful to SAS users. These datasets are mentioned in SASNEWS, which is printed by default in the SAS log whenever you run a SAS job. The purpose of this article is to provide more information about the contents of these data sets and how to use them.

APPL.STAT.SAS795.SAMPLE is a partioned dataset that contains many interesting sample programs which illustrate various aspects of SAS. There is at least one program for each procedure, and several for the more complex procedures. To get a report which gives a list of all available sample programs grouped by subject, run the following program:

```
// job
// EXEC SAS
//SAS.SYSIN DD DSN=APPL.STAT.SAS795.SAMPLE(INDEX),DISP=SHR
//
```

When you have chosen a sample you wish to run, substitute its name for 'INDEX' in the job above. Those samples with embedded JCL or requiring additional JCL should be examined before they are run.

APPL.STAT.SAS795.GSAMPLE contains a sample SAS/GRAPH program that can be run on any of the graphics devices available

continued...

SAS 79.5 INFORMATION continued

at UTCS. To run this program and get your output plotted on the Gould, submit the following job:

```
// job
// EXEC SAS,REGION=375K
//MAP DD DSN=APPL.STAT.SAS795.MAPS.DATA,DISP=SHR
//GSAMPLE DD DSN=APPL.STAT.SAS795.GSAMPLE,DISP=SHR
//SAS.SYSIN DD *
GOPTIONS DEV=GOULD NOCHARACTERS;
%INCLUDE GSAMPLE;
/*
//
```

This job is not cheap to run, but the examples are useful supplements to those given in the SAS/GRAPH manual. To run this job on another graphics device, just use the appropriate device name in the GOPTIONS statement. Since the Gould is not a colour device, it uses different line types when colour is specified. This may cause the plot's appearance to be slightly different from what might have been expected.

APPL.STAT.SAS795.MAPS.DATA used in the job above is the SAS dataset which contains the four cartographic files provided with release 79.5 of SAS/GRAPH. The format of these datasets is given in Appendix 4 of the SAS/GRAPH manual and their usage is described in the discussion of the GMAP procedure.

To produce the map of Canada featured on our cover, both of the identifying (PROVINCE and CD CODE) must be used. To specify that you want to use the Canadian map dataset, use the following PROC statement with the JCL above:

```
PROC GMAP MAP=MAP.CANADA;
```

Three datasets are also available, containing useful notes on each of the SAS products. APPL.STAT.SAS795.NOTES is the SAS79.5/MAIN Consultant's Reports, which provides usage notes and outstanding problems that are not documented elsewhere. Some of these notes do not apply to our system and others are quite technical, but many are helpful. Notes for graphics, APPL.STAT.SAS795.NOTESGRP, and notes for Econometrics and Time Series, APPL.STAT.SAS795.NOTESETS, are similar in content but much shorter. To get a copy of one of these datasets, run the following job:

```
// job
// EXEC IEBGENER
//SYSUT1 DD DSN=APPL.STAT.SAS795.NOTES,DISP=SHR
//SYSUT2 DD SYSOUT=(A,,2018)
//
```

Any feedback on these datasets and their usefulness would be appreciated.

Diane Mitchell

1981 ACM SIGUCC NEWSLETTER CONTEST

The following is a letter dated September 18, 1981 to Mr. Kaponeridis, the previous editor of *COMPUTERNEWS:*

On behalf of the ACM Special Interest Group on University Computing Centers, I would like to extend my congratulations to Computing Services of the University of Toronto for receiving an honourable mention in the 1981 ACM SIGUCC Newsletter Contest for excellence in cover concept and typography.

Judging was based on the general categories of appearance, organization, content, and style and was done by staff of the Division of Computer Research and Technology of the Computer Center Branch at the National Institutes of Health in Bethesda, Maryland.

There will be a special display of winning entries at the October User Services Conference in Atlanta, Georgia. (Please send a few copies of *COMPUTERNEWS* of which you are particularly proud to Joan Shumaker, ACM-SIGUCC User Services Conference IX, Business Administration

continued...

1981 ACM SIGUCC continued

Building, Room 101, Georgia State University Computer Center, University Plaza, Atlanta, Georgia 30303.)

Keep up the good work with *COMPUTER-NEWS.* I look forward to meeting you in Atlanta in October.

Sincerely,

Leslie Barden
SIGUCC Newsletter Contest

UTCS is proud to have received this honor and we are delighted that *COMPUTER-NEWS* was displayed at the SIGUCC conference. We thank the judging committee for their recognition of *COMPUTER-NEWS.*

TORONTO DECUS 1982

The 1982 DECUS Symposium will take place at the Harbour Castle Hilton Hotel in Toronto from February 9-12. Early interest in the conference is greater than ever before and a solid, information-packed four days is anticipated.

The Keynote speech will be delivered by Professor J.N.P. Hume of the University of Toronto on Wednesday, February 10. Professor Hume's interest in the digital computer in the early fifties led him to become one of Canada's first computer programmers. He was chairman of U of T's Department of Computer Science from 1976 to 1981, and he is currently Master of Massey College. Professor Hume is sure to provide his audience with a broad perspective on the history of computing, as well as an insightful look into its future.

Tuesday, February 9, will be devoted to a series of up to eight full-day, parallel, in-depth seminars or mini-courses on various topics of interest to DECUS members. This will give attendees a chance to study a particular topic in much greater depth than is normally possible in the short sessions of a regular symposium.

One of the major goals the planning committee set for itself was to substantially enhance the management oriented content of the Symposium. This is reflected particularly in three of the planned seminars. "Introduction to Local Area Networks", "Data Base Management" and "Software Project Management" are being specifically designed with managerial people in mind. Sessions are also being planned on such topics as the Office of the Future, Communications, and Graphics and Management (e.g., "Digital: How is it Organized Today").

As usual, many sessions will be offered within the traditional, technically oriented interest streams such as LCG, VAX/VMS, RSTS/E, RSX-11, RT-11 and Languages. Also, a new interest stream will be devoted to the UNIX family of operating systems.

Technical seminars which may be offered include "Setting Up and Maintaining an RT System", "Building and Maintaining an Efficient RSX System", "RSX Internals and I/O Drivers", "RSTS/E and the Task Builder", "RSTS/E V7 Optimization" and "Performance and Tuning" seminars for VAX/VMS, DECsystem-10 and DECSYSTEM-20. In addition, a half-day seminar entitled "Introduction to Computers" will be offered for interested non-professionals.

In addition to a variety of interesting exhibits, presentations, and discussions, many of Digital's newest products will be demonstrated in the display area. This year it is expected that demonstrations of software will be emphasized more than ever before.

A wide selection of other activities will also be available, such as an extensive spouses' program. The traditional banquet and dance will be one of the conference's

continued...

DECUS 1982 continued

highlights.

A more detailed description of the Symposium, the seminars and the sessions will be included in the Preliminary Program which is scheduled for distribution in mid-November. Watch for it.

To receive additional conference information write to:

Jeanne McNeish
DECUS Canada
P. O. Box 13000
Kanata, Ontario
Canada K2K 2A6,

or telephone 1-613-592-5111 (ext. 2782).

Dr. Edmund West

SUMMARY OF APL HOTNEWS ITEMS

It has become apparent that most users do not regularly check the APL HOTNEWS Facility, and that some are unaware of its existence. To assist users who check HOTNEWS infrequently, a list of dates and titles of recently issued HOTNEWS items will be printed in *COMPUTERNEWS* on a regular basis.

The following list encompasses HOTNEWS items entered between January 1, 1981 and October 16, 1981.

DATE	TITLE
18/03/81	Unexpected interrupt error
09/06/81	Workspaces in public library 826 will be purged at end of July
23/06/81	Installation of the PACX dial-in service, June 29, 1981.
30/06/81	A new utility, in ws 1 USAGE for getting accounting info.
30/06/81	Cummulative connect time and CPU will not be available in ⎕AI.
30/06/81	As of July 1, 1981, the APL sign-off message will be changed.
30/06/81	On July 1, n-tasks will become available to UTCS APL users.
30/06/81	APL will be down on July 1, 1981 from 7:00 to 13:00.
30/06/81	A change in the way storage and fileprints are charged.
30/06/81	The APL section of the C.A.N. reports is changing.
07/07/81	There will be a change in the charging of XFR jobs.
09/07/81	Receiving June accounting reports during the current mail strike
21/07/81	All jobs on the system at 12:05 on July 21, have been lost.
19/08/81	Accounting services is moving.
04/09/81	Recommended procedure to follow failure of an APL workspace.
01/10/81	Info on the new APL Release added to the 1 NEWRELEASE workspace.

APL HOTNEWS may be accessed by loading the workspace, *1 HOTNEWS.* Instructions on the use of this workspace are stored in the variable *DESCRIBE.*

Mary Ann Lawry

HIGH QUALITY PRINTERS FOR 3276 CLUSTERS

A number of users of IBM 3276 terminal clusters (or the Olivetti equivalent) have associated printers producing uppercase computer printouts. The quality available from these printers is generally moderate at the very best, and is unacceptable for text applications. Expanded facilities now available to 3270 type terminals (ATMS and WYLBUR in particular), together with increasing use of text facilities have resulted in concern over improved quality output devices.

UTCS has tried two possible methods of providing a low cost solution to this problem of printing quality, and we would like to bring these to the attention of our users.

Users with an IBM 3276 controller may take advantage of an interface box available for about $2,500. This box permits the connection of any typewriter terminal, which will then appear to the system as if it were a 3287 printer. Such terminals should be capable of producing high quality output. Terminals which may possibly be used for this application include the Xerox 1620, Xerox 1641, Trendata or Datamex terminals.

Users with an Olivetti cluster using a Centronix printer could employ an alternative interface costing approximately $550 with the same kind of printers as mentioned above.

When using either of these alternatives, no changes are required to the network configuration or system parameters. The quality of printing will appear to be that of a good quality typewriter, but the throughput, or speed of printing, will be reduced from that available on older printers. For areas where the printers currently are associated with IMS, printers may be moved from IMS to ATMS by contacting the console operator at 7335. Facilities in WYLBUR and TSO do not permit the ready use of these printers at the present time.

Dr. Frank Spitzer

UTCS CHANGE COMMITTEE

The following Change Committee items are in order of their "Change number".

- The scheduled installation date for the ACF2 security package has been deferred to January 4, 1982.
- The tapes containing VS-FORTRAN 77 have finally arrived from IBM. Installation work has yet to be scheduled.
- The date for the CALCOMP 1051 colour drum plotter user test was deferred to November 2nd. The complexities of establishing a realistic charging scheme for the new plotter are still being discussed.
- The cheaper CLASS C summertime memory rates have been increased to their normal academic term rates.
- Intel has delivered the solid-state disk device (called a FAST-3815) which will enhance the performance of the IBM 3033. This enhancement became necessary when APL and ATMS services were recently transferred from the administrative machine to the academic machine, causing a severe increase to the academic machine's load. Our objective is to restore the 3033's performance to the level it was at before this transfer took place last spring - or possibly even to improve upon it.
- The IBM Series/1, which is to be used as an ASCII 3278 emulator/controller, is now on the machine room floor. A scheduled production date isn't yet available.

continued...

UTCS CHANGE COMMITTEE continued

- It has been established that the current version of SHARP APL won't work under MVS/SP. It is clearly desirable, therefore, that installation of the new SHARP APL version (Change Request #286) be carried out before any attempt to install the new MVS/SP release (Change Request #303).
- Approval of Change Request #304 resulted in the installation on October 1 of a WYLBUR EXEC file which gives WYLBUR users access to SYS3.HELP.
- Effective on August 24, an identifier to the programmer name was installed on WYLBUR EXEC files, enabling users to distinguish utility functions on their month-end CAN reports.
- The Text Processing product line group has proposed that UTCS evaluate a text-processing product called SCRIBE. This product could potentially provide a uniform text processing facility throughout most of our environments. The initiating Change Request (#307) asks for a trial acquisition of this product for Text Processing PLG evaluation on the DECsystem-10. While the Change Committee has approved this request in principle, it must be discussed further by management. This is partly due to uncertainty over whether the DEC-10 will be able to accommodate this product without significantly impacting an already constrained system.
- A proposal has been put forward to replace "ED", the main UNIX editor, with Zoology's version. Prior to further Change Committee consideration, questions regarding maintenance and compatibility with the present editor must be answered.
- Change Request #311 proposed that RPG-II be made available on the DECsystem-10. This was approved at the meeting of October 8, and carried out on the same day. Change Request #309 also pertains to DEC-10 users: a backslash is to be introduced for the TN train on the 1403 printer in the Engineering Annex. There's no projected date for this item yet.
- The SAS/Graph and KIG interface was upgraded on October 26. It will introduce a number of new graphics facilities and options. For more information, see the article on this subject on page 7.
- The WYLBUR "DO" facility will be enhanced on October 19. WYLBUR users should "DO NEWS" for details.

Terry Farley

COMPUTING NEWS IN BRIEF

This month we introduce a new feature, a summarized round-up of current developments in computer-related research and instruction at other Canadian universities.

Videotex Project features Multi-level Databank - Universite du Québec

William Blake once made the inspired pronouncement that "to generalize is to be an idiot". While this may seem an extreme view to some, it is held very seriously by a group of telematics researchers at the Universite du Québec.

Two schools of thought have emerged in the debate over how public videotex databases should be structured. Should they contain general information, useful to the population at large, or more specialized information to meet the needs of predefined interest groups? Project Agora, created by the Telematics laboratory at the Universite du Québec, is a unique videotex project exemplifying the latter point of view.

Based on the premise that a general database, while applicable to large numbers, is too superficial to be genuinely useful, Agora is a non-commercial application of Telidon technology which features a multi-level databank. This multi-level databank is designed to meet the informational needs of a large population with a wide-ranging

continued...

COMPUTING NEWS IN BRIEF continued

selection of specialized information. Agora developers hope to demonstrate that the needs of society are served best by a mosaic of particular information rather than a melting pot of general information.

The laboratory is also involved in media technology research and in the development of the communication potential of computer-generated graphics, video, and print.

Computer Games in the Classroom - University of Calgary

The Alberta Department of Advanced Education and Manpower has funded the development of a computer game named Pisces to the tune of $50,000. While this might seem a trifling way to spend such a sum, researchers at the University of Calgary hope their game will develop the pedagogic potential of computer technology more fully. Pisces is in fact an extremely sophisticated computer game which both instructs and entertains its participants.

The Pisces program allows players to establish and control policy, taxes and investments for a country of their choice. Students can either play solo or in teams of such interest groups as trade unions, industrialists, and government. The decisions they make in their chosen roles can have either a beneficial or detrimental effect on such problems as inflation, unemployment, pollution, and so on. In short, the game is an accurate simulation of the complex business of running a nation.

The principle aim of the game is to teach students how countries operate and the various factors which contribute to its efficient operation through first hand experience. As well, the game is intended to develop latent administrative and decision-making skills.

Education Faculty Acquires 40 Micros - University of Alberta

The oil fields of Alberta have again proven rich ground for the development of computers as instructional tools. The University of Alberta has recently acquired forty complete microcomputer systems from an Ontario company to modernize their Education Faculty. The micros will be used for teacher training in response to urgent demands for computer instruction in the province's high schools. In the past, an acute shortage of adequately trained teaching staff had forced schools to relegate any newly acquired computer equipment to their storage rooms.

Kathy Dunlop

7 YEARS AGO

The following article is reprinted from the November 1974 issue of *COMPUTER-NEWS.*

STATISTICAL ANALYSIS SYSTEM NOW AVAILABLE

SAS (Statistical Analysis System) is a statistical system offering statistical facilities similar to SPSS and Datatext (with several additional non-duplicate facilities). SAS also provides greater flexibility and scope in language statements (resulting in a greater similarity to facilities found in higher level programming languages).

Functional data capabilities include transgeneration of variables, page titling of output, subsetting of data, missing value recognition and handling, and limited error checking of input data.

Programming features include:

- assignment statements to create new variables

continued...

7 YEARS AGO continued

- IF-THEN statements to test for the occurrence of various conditions and to determine a suitable course of action
- DROP statements to exclude variables listed from the SAS datasets being built
- DELETE statements to omit particular observations from the dataset being built
- selection of observations to go into the SAS dataset being built through subsetting IF statements
- program statement labels and GO TO and LINK statements to allow for non-sequential execution of SAS program statements
- MACRO statement capabilities

SAS is currently available at UTCC and can be accessed by specifying the following JCL:

```
col. 1
    // JOB card
    // EXEC SAS
    //SAS.SYSIN  DD  *
          .
          . SAS program statements
          .  and data
    /*
```

Draft copies of a document which describes in detail the functions and features of SAS statistical procedures, will be available at the Information Office, SF128.

Len Prepas

LETTERS

Sirs:

I am writing with regard to your article in *COMPUTERNEWS* #193 about the LIBRA service replacing keypunches for undergraduate work. There seems to be a trend towards building a multitude of undergraduate terminals on the St. George campus. Why not use one or a few sites instead, thereby using economies of scale to reduce costs and provide better service (by using a higher-speed printer, for example)?

To review the situation, there are terminals at ASUT, EUT, and now ZUT and soon Robarts library (RUT?!). The fastest printer will, I assume, be around 1100 l.p.m., and the readers will have speeds not greater than 1100 c.p.m. The maximum distance between terminals (EUT to RUT) is about 0.5 km. In peak periods, the printers seem to be the bottleneck. Would it not make sense to upgrade the printers to faster models? If necessary, terminals could be amalgamated.

The savings would, I feel, come from the following sources:

1. Fewer printers to maintain (there are at least 11 IBM-based printers on the St. George campus).
2. Reduced labour costs since there would be fewer sites to supervise and service.
3. Better turnaround could improve the educational experience for the students.
4. If a really sophisticated printer were available, users of other systems (DEC, UNIX, VAX) might print their jobs via these printers. Then there would be an additional savings by eliminating even more printers, many of which are slow printers.

I don't think there is a need for several terminal sites, because of the short distances on the downtown campuses.

Brian Nixon

Bill Lauriston, Manager of Operations at UTCS, replies:

continued...

LETTERS continued

You ask why we have a multitude of undergraduate terminals instead of one or a few. I rate four terminals (including the proposed Robarts site) closer to a few than to a multitude. The VAX 11/750 provides a standalone UNIX service and cannot be considered a terminal.

You suggest upgrading printers to faster models to be funded from various savings. I do not believe that your approach is an appropriate one for the following reasons:

1. Maintaining multiple printers is a cost-effective way of providing increased capacity while minimizing the impact of failure and maximizing the ability to place that capacity where it is needed.
2. Because only one of the terminal sites requires operations staff, labour costs will not change by terminal consolidation - the requirement for advising being dependent on the number of users rather than the number of sites. Furthermore, the difficulties in acquiring space on the St. George campus make it impractical to consolidate and, in fact, impose the opposite, as in the case of the LIBRA facility which had to be located in the Robarts Library.
3. Better turnaround is not guaranteed by consolidating printing capacity; multiple units provide greater job throughput at equivalent print speeds. High capacity single units concentrate users, giving rise to crowding and user inconvenience; multiple units reduce the crowding effect and, at the same time, allow the provision of printing capacity at the same location as other facilities (i.e., card readers, LIBRA terminals).
4. UTCS has studied the acquisition of a Xerox 9700 (perhaps it might be considered a really sophisticated printer) but could not justify its great expense and reduced flexibility.

In conclusion, I believe that there is a need for several terminal sites and that centralization of such facilities runs counter to user-driven trends toward decentralization/distribution.

PERSONNEL CHANGES

Formerly Manager of Academic Services then Acting Manager for Business, (and one of our better baseball players) **Ralph Lombardi** has left UTCS to work for the Bank of Commerce. Best of luck, Ralph.

After many years with UTCS **Mark Tapia** has left to work at Manulife. He has been active in many projects, the latest being LIBRA and will be missed greatly. We wish you lots of luck.

Ron Vander Kraats, former Supervisor of Hardware Systems in CSS, is now the Supervisor of Communications Systems.

Ted Sikorski, previously an advisor in EAT, is now working with the Systems Group. The new advisor, replacing Ted is **Terry Jones.**

The new LIBRA co-ordinators will be **Frank Pearce** from Operations and **Merton Hunte** who previously worked at AST/ASUT. **Frank Cianfarani,** also from Operations, will replace Merton as Coordinator at the Arts & Sciences Terminal.

Previously working as a tape disk operator, **Steve Chesney** has been promoted to Console Operator. Replacing "Chesnuts" is **Steve Cochrane** who worked as an operator in the Engineering Annex.

Several newcomers will join UTCS this month. The new Business Manager is **William Murphy,** who previously worked at UTLAS. **Peter Smith** will work in the Systems Group. **Thea Smith** and **Dave Grossman** will both be working in the Information Services Group, Thea as a technical writer/editor and Dave as a programmer.

Kathryn Bourne

UTCS SYSTEMS

3033/N8 PROCESSOR

- located in McLennan Physical Laboratories
- provides General Purpose Job Stream, High Speed Job Stream, TSO, WYLBUR, APL and ATMS services
- 8 megabytes of memory
- MVS with JES2

4341 PROCESSOR

- located in McLennan Physical Laboratories
- provides administrative IMS/VS DB/DC, Batch and TSO
- 8 megabytes of memory
- MVS with JES2

DECSYSTEM-10 Model 1090

- located in McLennan Physical Laboratories
- provides General Purpose Time-Sharing
- 256 K - 36 bit words of memory
- TOPS-10 operating system

COMMUNICATIONS & SMALL SYSTEMS (CSS)

- located in Old Metro Library Bldg., room 244
- DEC PDP-11/40 with GT44 Graphics
- DEC PDP-11/05 with GT40 Graphics
- Various Z80-based microcomputers (S-100, CP/M)
- Radio Shack TRS-80
- Western Digital Pascal MicroEngine
- Apple II Plus
- provides specialized interactive graphics
- provides online and real-time computing services, data acquisition and conversion, and minicomputer services

UTCS DIRECTORY

POSITION	ROOM	CENTREX PHONE NUMBER
Director		
Dr. Doron Cohen	MP350	8948
Associate Directors		
Al Heyworth	MP350	4936
Eugene Siciunas	MP350	5058
Faculty Liaison Officer		
Dr. Frank Spitzer	MP350	4619
Communications & Small Systems Manager		
Norman Housley	ML350	4967
Operations Manager		
Bill Lauriston	MP350	7092
Systems Manager		
Ward Beattie	MP350	3579
Academic Services Manager		
Terry Wood	MP350	7130
Administrative Services Manager		
Don Gibson	MP350	7331
Business Manager		
William Murphy	MP345	4428
Executive Assistant, Research & Planning		
Wendy Chin	MP350	5568
Information Services Supervisor		
David Reed	EA206	2066
General Inquiries	EA206	4990
Accounting Supervisor		
Marg Doherty	MP331	3960
Accounts (U of T)	MP257	8702
Accounts (External)	MP257	7148
Access Codes	MP257	8703
Programming Services Supervisor		
Paul Roth	SG205	8701
Applications Supervisor		
Herb Kugel	SG304	7286
CSS Software Development Supervisor		
Ian Darwin	ML244	6134

continued...

UTCS DIRECTORY continued

Text Services Supervisor		
John Bradley	MP217	3995
Entry Services Supervisor		
Vera Cabanus	MP217	5040
Text Entry, Keypunching	MP217	4565
Data Entry	MP217	5273
Computing Services Representatives (CSRs)		
Engineering Annex		
Sue Chong	EA104	4357
Advisors	EA103	4516
Time-Sharing Support		
John Mavity	SG204	7109
Advisors	SG204	6465
Erindale		
Peter Wall	2043	828-5311
Scarborough		
Bob Blackburn		284-3173
Arts and Science		
Bill Fehlner	SS2133	6509
New Physics		
Bob Chambers	MP1202	8823
External		
Ihor Prociuk	SG200	6875,6885
Supervisors, Operations		
Paul Scarborough (IBM 3033N8)	MP368	6220
Krishna Patnaik (DEC-1090)	MP368	4086
Dave Wong (IBM 4341)	MP368	6864
Tape Librarians		
Academic Services	MP368	7319
Administrative Services	MP368A	6693

Key:

EA = Engineering Annex
MP = McLennan Physical Laboratories (New Physics)
SG = 49 St. George
ML = Metro Library
SS = Sidney Smith

Job and System Status Queries

SYSTEM/3033N8A / TSO, WYLBUR, BATCH, ATMS, APL	7393
DEC-1090	4318

Time-Sharing Services through PACX	**Dial-Up**
DEC-1090,APL,ATMS,TSO,WYLBUR	6200 Centrex 6201 Non Centrex

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I would like more information on ____ .

Please have a Computing Services Representative (CSR) contact me. My phone number is:

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Comments on this issue of *COMPUTERNEWS*:

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